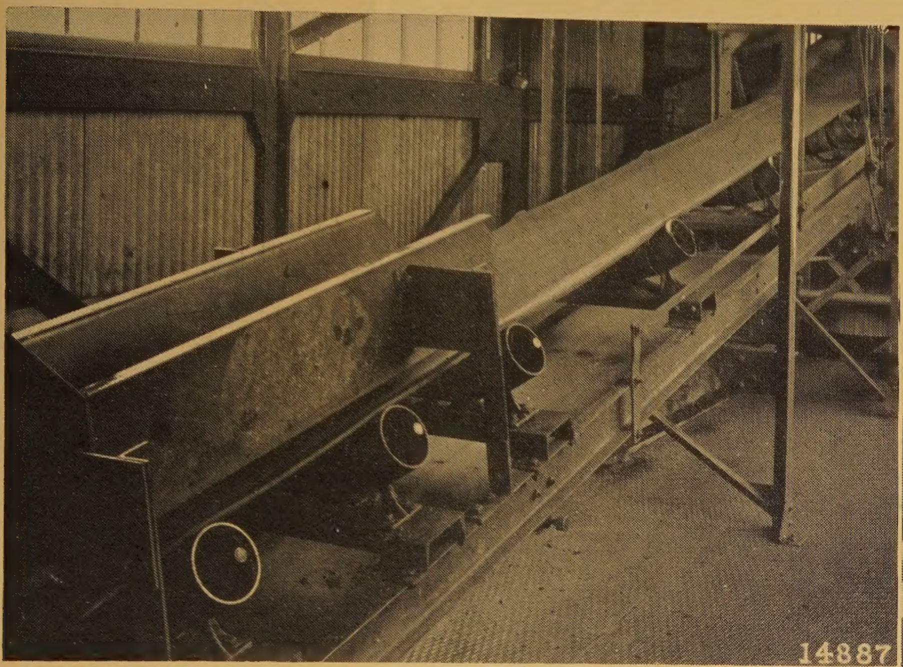
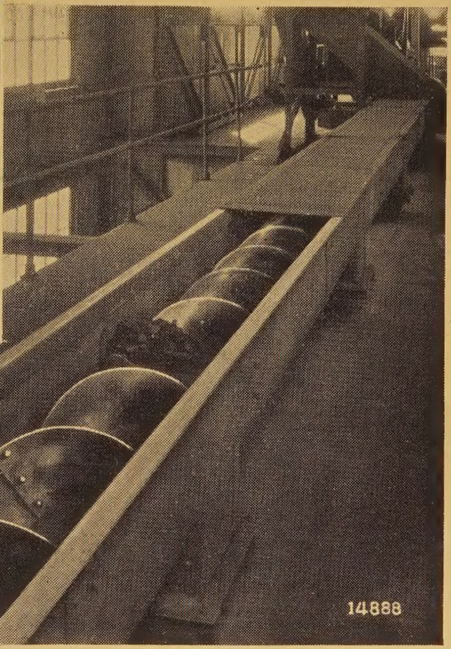
MILL SECTION of

Concrete





Jeffrey Belt Conveyor carries crushed coal to the weighometer. Jeffrey Spiral Conveyor carries coal to bins.

Handling Coal at Southwestern

At the Southwestern Portland Cement Company's plant, Osborn, Ohio, Jeffrey Conveyors handle the coal in the power house.

A Jeffrey Single Roll Crusher reduces the coal to one-and-one-half inch size. The coal handling equipment consists of an elevator, a belt conveyor and a spiral conveyor—all Jeffrey made.

Jeffrey installs complete coal handling equipments for power houses.

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MATERIAL HANDLING EQUIPMENT

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- Elevators—Conveyors
- Portable Loaders
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- Locomotives
- Coal Mine Equipment
- Tipple Equipment
- Ventilation Fans

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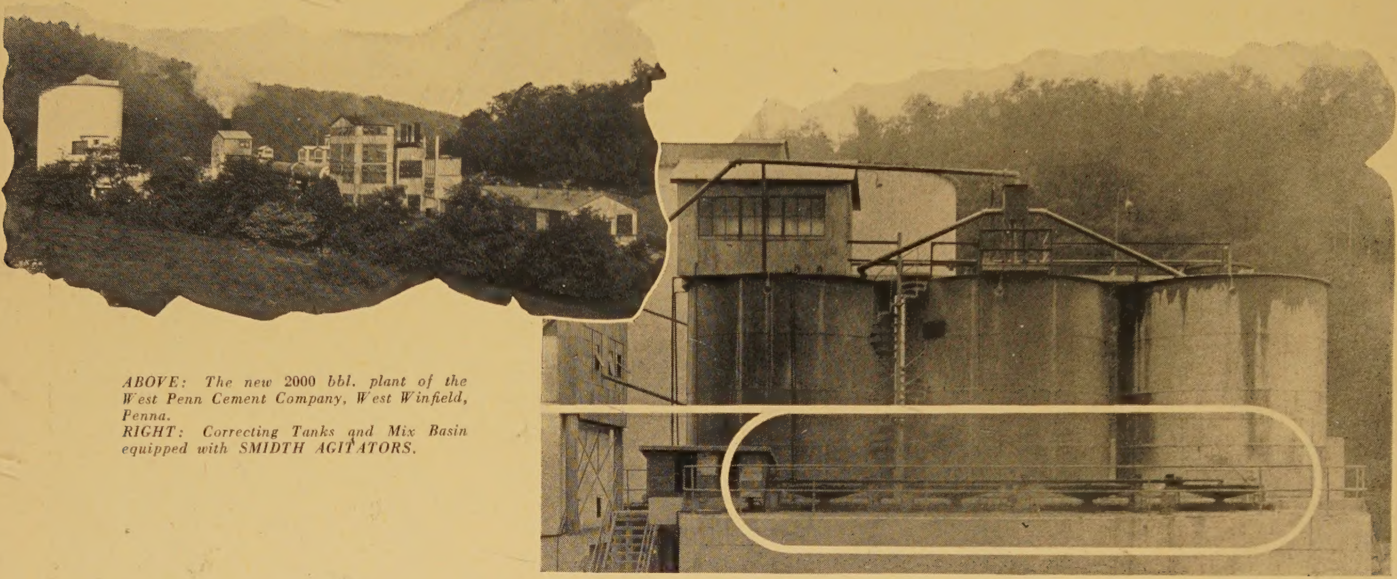
AGITATORS



ABOVE: The new 2000 bbl. plant of the West Penn Cement Company, West Winfield, Penna.
RIGHT: Correcting Tanks and Mix Basin equipped with SMIDTH AGITATORS.

AT the plant of the West Penn Cement Company, illustrated above, are three Correcting Tanks, each 20′ diameter by 20′ deep, to which the slurry is fed from the grinding mills; also, one Quadruple Mix Basin, 20′ diameter, 21′ deep and 51′ long, into which the slurry, properly proportioned, is fed from the Correcting Tanks, making the proper chemical composition.

In this installation the Correcting Tanks are of steel but they are also frequently made of concrete. The Mix Basin is made of concrete.

The Agitators, furnished by F. L. SMIDTH & CO., INC., for the above equipment, combine mechanical agitation with air. On each of the stirring arms is mounted an air nozzle through which is supplied a quantity of air just sufficient to make the vertical mix. The stirring arms mechanically make the horizontal mix.

F. L. SMIDTH & CO., INC., have been supplying agitating equipment for more than FORTY-FIVE YEARS, some recent installations being at the plants of the

Lehigh Portland Cement Co., Birmingham, Ala.
Lehigh Portland Cement Co., Mason City, Iowa
Phoenix Portland Cement Corp., Birmingham, Ala.
Glens Falls Portland Cement Co., Glens Falls, N. Y.
Missouri Portland Cement Co., St. Louis, Mo.
Olympic Portland Cement Co., Bellingham, Wash.
Southwestern Portland Cement Co., Osborn, Ohio
Standard Portland Cement Co., Painesville, Ohio
Michigan Alkali Company, Wyandotte, Michigan

For the storage of slurry a very efficient arrangement is the long quadrangular concrete basin equipped with the SMIDTH Traveling Agitator.

F. L. Smidth & Co., Inc.

ENGINEERS

50 Church Street

Designers and Equippers of
Cement Making Factories

NEW YORK

Factory Foundry and Laboratory—Elizabeth, N. J.

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MILL SECTION of

Concrete

The Mill Edition of CONCRETE is edited for the manufacturers of portland cement, lime and similar products. Its pages are devoted to discussions of plant design, management, operation, production efficiency, chemical research and control, quarry operation, progress and news of the industry.

The Mill Edition also contains all the material published in the corresponding Regular Edition and so provides news of the uses and merchandising of the materials whose manufacture is discussed in the Mill Edition.

The Regular Section furnishes mill operating officials and mill executives valuable points of contact with the users of the materials they produce.

Volume 31 September, 1927 Number 3

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Complete Cement plant Equipment, Solo Mills, Solo Kilns, Zet Crushers, etc.

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POLYSIUS CORPORATION
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MILL SECTION of

Concrete

Vol. 31 Chicago, September, 1927 No. 3

New Plant of Dewey Portland Cement Co. Has Interesting Features

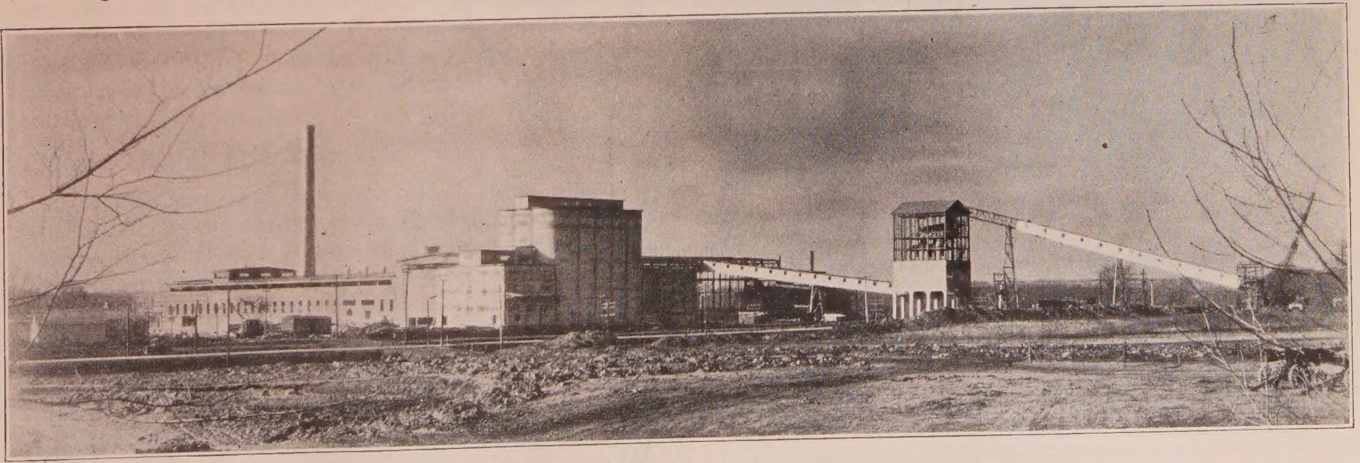
Description of the Plant—New Type of Tipple Used—Material Handling and Storage—The Mill Room—Tube Mill Feeder Operation—Unusually Flexible Slurry Handling System

Part I

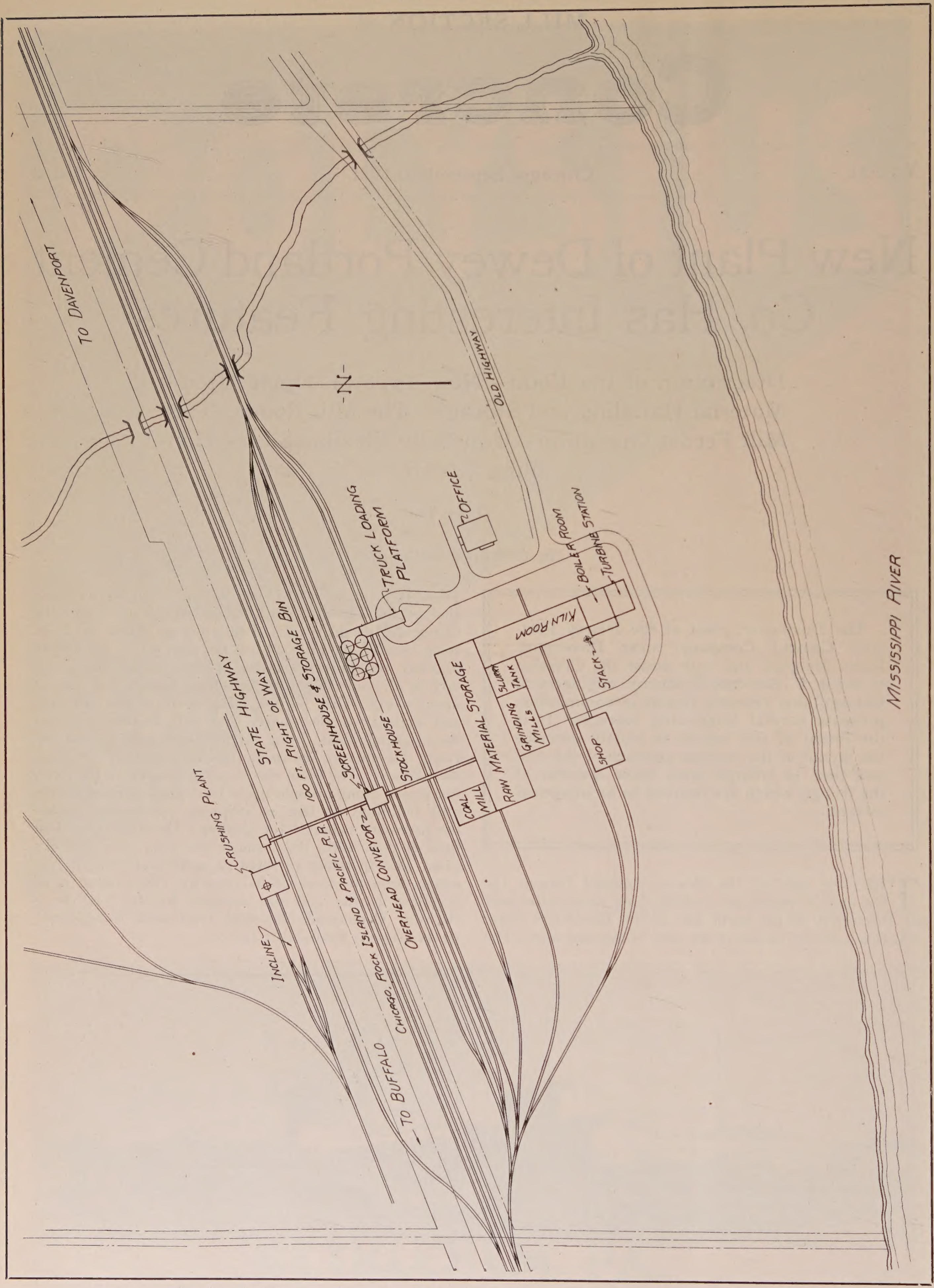
By GORDON SMITH

The Davenport plant of the Dewey Portland Cement Company, near Davenport, Iowa, designed and built under the direction of the J. C. Buckbee Company, engineers of Chicago, and recently placed in commission, presents several interesting features. It is the intent of this article to briefly describe the layout of the various portions of the mill and then to enlarge upon those features of the design which are deemed to be of special interest.

THE new mill of the Dewey Portland Cement Co. Co. and its quarry are located about seven miles west of Davenport on the north side of the Mississippi river. (At this point the course of the river is east and west.) The property totals about 215 acres, and is cut by the main line of the Chicago, Rock Island and Pacific and the Chicago, Milwaukee & St. Paul railways, about 60 acres lying between the railroad and the river edge. A concrete highway parallels the tracks to the north. The property is all underlain with limestone suitable for cement manufacture. That portion lying north of the railroads and highway is the quarry, the mill buildings, except the crushing plant, being on the south side nearest the river. The quarry site itself rises in a gentle slope from the highway. The plant site slopes gradually to the river, but is now being brought up to level grade around all the mill buildings as fast as stripping operations provide the necessary material for grading. The kilns were first fired on June 14th, 1927, and in less than sixty days the plant was operating to rated capacity and shipping demands were in excess of its capacity. The cement is of excellent quality and was accepted by the Iowa State Highway Commission for state road work within three weeks after its availability for test.



A general view of the new plant

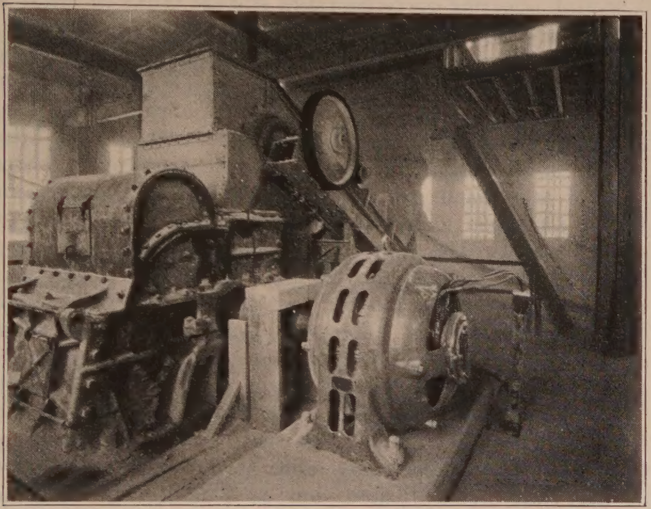


Plant layout of the new plant of the Dewey Portland Cement Co. near Davenport, Iowa

Raw Material and Quarry

As mentioned above, the quarry and crushing plant are located on the north side of the railroads and highway. The stripping varies from 6 to 15 feet over the quarry site proper. The upper strata of the underlying limestone are almost of a natural cement mix, while the lower strata, or Davenport limestone, are of higher calcium content. The overburden is for the most part of such a nature as to provide the silicious and argillaceous materials required for cement making purposes, so that it is not anticipated that it will be necessary to go off the property for raw materials other than coal and gypsum.

Keystone well drills, electrically operated, are used in the quarry for preparing the shots. The stone breaks well and at present is being rather heavily shot to assist in opening the quarry. A model 100-B Bucyrus electric shovel loads 8-yard all-steel Easton cars which are handled at present from the foot of the single track incline to the crusher house. Future plans include electric locomotives as the quarry develops.



The Gruendler hammer mill in the crusher house

The crusher plant consists of a 42-inch McCully gyratory crusher followed by a Gruendler hammer mill. The hammer mill discharges onto an inclined belt conveyor running parallel to the tracks to a junction tower, where a second inclined belt conveys the crushed rock at right angles across the tracks to the screenhouse. Here a 72- by 28-foot Galland Henning rollerless screen makes such separation as may be desirable for grinding mill feed. Provision is made here for duplication of the screening units and installation of auxiliary screens and crushers should the furnishing of commercial crushed stone prove a desirable venture. From the screenhouse the stone is delivered to the material storage building by a third belt conveyor.

Quarry Incline and Tipple

A single track incline serves the crushing plant. Cars are pulled up this incline by a friction hoist whose jack shaft is driven from a 200 hp. motor by an Allis-Chalmers Texrope drive from a 200-hp. motor. This machine is equipped with two independently controlled drums: one for hauling cars up the incline and the second and smaller drum for operating the tipple which is of special, and unique design.

The 8-yard cars were built by the Easton Car and Construction Co. and are of their conventional type except that the car body is rigidly attached to the frame. As a car reaches the dumping point opposite the crusher hopper, it runs onto a tipple consisting of two steel frames mounted on a tilting platform, the whole being carried on a heavy steel through shaft and actuated from the dumping drum of the hoist by steel cables. The frame on the side of the tipple nearest the crusher is rigidly attached to the platform and provided with a wooden buffer on which the side of the car rests when it is being dumped. The frame away from the crusher rides in a slide and is counterweighted so that as the tipple turns over, the car frame is firmly gripped and prevented from going on over into the crusher. At the same time this device compensates for the varying height of the cars due to uneven loading, wear in the trucks and sagging in the springs.

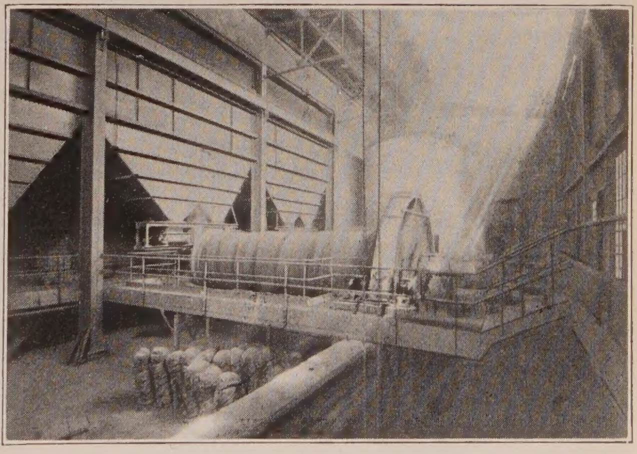
When a car has reached a position opposite the crusher, the dumping drum is engaged and the tipple and car are turned through an arc of about 90 degrees, depositing the contents of the car directly onto the crusher spider arms and in such a way as to minimize spillage and bridging. The tipple proper is counterweighted and the weights are so arranged as to assist in starting the dumping action. Then as the car approaches the top position, the same weights go over center and retard the action of the hoist.

Steel quadrants below the tipple frame guide the rope. The action of the tipple is exceptionally smooth and altogether free from shock and vibration. Wire ropes are used throughout and the operation is noiseless except for the crash of the falling stone as it hits the crusher hopper. The dumping takes only a few seconds and the car starts off the tipple by gravity and then down the incline to the quarry floor and shovel.

Provision is made for the installation of duplicate equipment on the other side of the crusher and for a second hammer mill whenever the demand for stone necessitates such additional equipment.

Material Storage Building

The mill buildings are grouped around a material storage building 100 feet wide by 400 feet long, about 60 feet above grade to the eave line. On one side of this building is an elevated track on which coal and gypsum are received. On the other side, at one end, is the kiln building, the coolers extending into the storage buildings and discharging into a concrete clinker pit. Next to the kiln building is the slurry tank room and next to that is the grinding mill room. In the storage building ahead of each mill are two bins; high-lime- and low-lime bins ahead of the raw grinding mills and clinker and gypsum bins ahead of the finishing mills.



The mill room. Note the mill bins on the left

The conveyor system mentioned before delivers high or low limestone into the bins ahead of the raw mills through chutes equipped with shutter gates. Surplus stone spills out of these bins onto the floor of the building. This surplus raw material is piled and reclaimed by a 2½-yard F. & H. bucket crane overhead, which crane also handles clinker and gypsum into and out of storage and into the mill feed bins. Coal is handled into and out of storage in a similar manner, a track hopper being provided on the coal track inside the building for unloading cars direct.

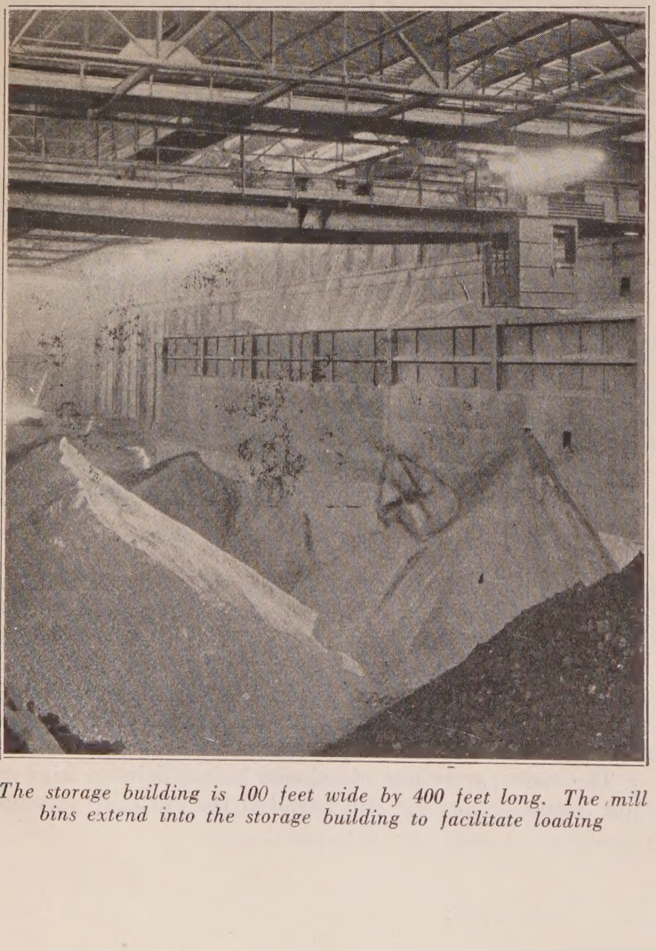
Mill Room

The mill room houses two 7- by 26-foot Allis-Chalmers two compartment wet grinding compeb mills and two dry grinding mills of the same kind and size. The raw material from the feed bins in the storage building is fed to the scoop type feeders on the mills by reciprocating plate feeders. A chain drive from the mill trunnion operates the feeder countershaft through a friction clutch. This shaft carries an adjustable throw crank and its reciprocating motion is carried to the feeder through a push rod to a second adjustable throw crank on the feeder shaft, so that any desired stroke may be imparted to the feeder plate. The second, or low lime, feeder is operated from the first through a horizontal reach rod and adjustable crank. By means of the adjustable features of the cranks actuating the feeder shafts any desired stroke may be imparted to either plate and the ratio of low to high lime material may be varied to suit the chemist's needs. In addition, the depth of the stream over each feeder may be varied by means of a rack and pinion operated cut-off gate. Great care was used in the design of these feeders, to make their adjustment flexible and at the same time simple.

The feeders for the finishing mills are of similar design, but the design altered to use a plate feeder for clinker and a screw feeder operated by a ratchet system for the gypsum.

The gypsum feeders and their ratchet operating gear are designed to give a variable gypsum feed from 0 to 4 per cent, as may be required.

Paralleling the mill room and separated therefrom by a partition wall is the motor and compressor room. Here are found four 500 h.p. Allis-Chalmers synchronous motors driving each mill direct through Cutler-Hammer magnetic clutches, through 676 cu. ft. two-stage Ingersoll-Rand compressors direct driven by 110 h.p. General Electric motors and one 1170 cu. ft. Chicago Pneumatic Tool Compressor with 200 h.p. motor, together with necessary exciters, control panels, etc.



The storage building is 100 feet wide by 400 feet long. The mill bins extend into the storage building to facilitate loading

Slurry discharges from the raw mills into a concrete sump from which a 4-inch Wilfley pump delivers same into the correction tanks in the slurry tank room.

Two 8-inch Fuller-Kinyon pumps receive the finishing mill discharge and transport the cement through an overhead bin to the cement storage tanks.

Slurry Handling System

The slurry handling system, in addition to the pumps mentioned above, consists of nine 20-foot diameter by 42-foot high concrete correction and storage tanks in the tank room adjoining the storage building and between the mill room and kiln room, two 4-inch Wilfley pumps serving these tanks, three 20-foot diameter by 20-foot high kiln feed tanks in the kiln room, one 4-inch pump for kiln feed and Allis-Chalmers ferris wheel type feeders on each kiln.

The nine tanks in the tank room are arranged in three rows of three each, all interconnected with a double pipe system equipped with 6-inch Merco Nordstrom plug type slurry valves. The piping is so arranged that the pump handling slurry from the trough following the grinding mills may discharge into any of the nine tanks through one system of piping. The two pumps in the tank room may receive on the suction side from any of the nine tanks and discharge into any other tank or into any of the kiln feed tanks. Either pump may be used for this purpose and both may be used at the same time, either for pumping different tanks or the same tank, as desired. The above sounds rather complicated, but as a matter of fact the slurry piping is extremely simple considering its flexibility.

The pump in the kiln room delivers slurry from the kiln feed tanks to the slurry feeders as required. The feeders are driven by 5 h.p. two speed motors, Falk gear reducers and roller chain drives, the two speed motors being electrically interlocked with the two speed kiln motors. Overflow from the feeders runs back into the kiln feed tanks. The kilns are fed through water-cooled spouts of conventional design.

Agitation of the slurry is done by compressed air, admitted to each tank through eight ¾-inch pipes. Each pipe has its own individual plug valve and in the air main ahead of each tank is placed a pressure regulating valve so that a close regulation may be had as to the air used in agitation.

(To be continued.)

Conservation of Fuels Meet Planned by A. S. M. E.

The first National Fuels meeting of the American Society of Mechanical Engineers will be held at St. Louis, Missouri, October 10th, 11th, 12th and 13th. This is to be a forum arranged by the Fuel Division of the organization for engineers interested in the use and conservation of fuels. Other technical and trade organizations are sponsoring the meeting. Its ultimate object is to improve the present method of using fuels, to result in property saving, fuel conservation, and financial gain.

The program is divided into four sections, as follows: General, industrial, power plant, and smoke abatement. Men of international reputation, who are recognized authorities, will present papers. Ample time will be allowed for discussion.

Cost Accounting for the Cement Mill

Presenting a Method for Analyzing Cement Manufacturing Costs and Recording Them—Simple Forms Needed to Keep Accounts

By G. C. LIEB, C. P. A.

THE purpose of this paper is to deal with some of the more salient accounting questions in connection with cement manufacture. Inasmuch as the general financial accounts of cement companies do not present many problems of a peculiar nature, we will confine ourselves largely to cost accounts.

As in other industries, it is obvious that the accounting needs of different companies will vary, depending upon the capacity of the mills, location, physical layout and other considerations. It is only natural, then, to suppose that some of the methods described may be somewhat too elaborate for one concern and not sufficiently detailed for another, depending upon individual circumstances and requirements. With these limitations in mind, we will proceed.

For the purpose of this discussion, the accounts will be considered under the following subdivisions:

I Labor
II Material
III Overhead
IV Card of Accounts
V Co-ordination of Costs

I—Labor

When one considers the character of the average cement mill hand, many of whom are foreign born, it becomes patent that the payroll scheme should be as simple as possible. Three independent records are commonly maintained in support of the hours worked by the men, viz., clock recorder, foremen's daily reports and field checkers' records.

Many different types of clock recording devices are in use, each having its own particular advantages. A model which operates quite satisfactorily under these conditions is a clock recording upon a daily tape, which accommodates 150 names. The hours of arrival, "out" and "in" for lunch period, and departure at night are all recorded from left to right on a single line against the particular employee's number. Six different readings, in all, may be recorded upon the same line, which is sufficient to take care of the "out" and "in" punch of an employee who goes home for supper when working overtime. This clock has the advantage of being "foolproof," insofar as the men are concerned and the tape, which is removed daily, presents a clear, concise record of the hours worked.

The foremen's daily reports, which are submitted to the time department, should show the department, number of each man, nature of work performed and the number of hours worked; where men are on a piece work basis, this report should, of course, show the production of each man.

The field checker's duty is to make one or more daily visits to all departments, in order to account for the presence of each man at his post and to insure the proper accounting distribution of time worked.

Foremen's daily reports are coded on the following day with the proper account numbers by the field checkers, and, after they have been compared with the hours shown by the clock tape, are ready for posting to the payroll sheet (Exhibit A).

The payroll sheet shown is designed to cover a semi-monthly pay period, with wage payments made by check. Four lines are provided for each employee, to take care of the charging of one man's time to more than one account during the period, also where a hand received several different rates during a half month, e. g., an assistant miller may temporarily act as a miller. In the event that four lines are not sufficient for a given man, a "transfer sheet" may be resorted to for the additional space required and the total thereof set opposite his name on the payroll proper, in the column headed "Transferred."

A rate card should be maintained in respect of each man, indicating his name, address, signature, clock number, date hired, position, department, rate, superintendent's approval and space for rate changes with the necessary approval.

II—Material

The material accounts may logically be divided into three groups, viz., raw materials, manufactured materials and stores.

Owing to the bulkiness of the materials used in production, the handling charges applicable thereto (such as cost of removing coal, limestone, etc., from the railroad siding to the point of consumption) become an important part of the final raw material cost. It is, therefore, essential in the interest of accurate accounting, that material accounts, subsidiary to those mentioned in the card of accounts, which is shown below, be kept according to physical location. By way of illustration, account G-10 (gas coal) could be subdivided as follows: on siding, stock pile, at boiler house, at stone dryer, at kilns. Handling labor is, of course, charged directly to the material accounts, through the pay roll distribution.

A monthly material report should be submitted by the mill to the cost department, disclosing the following information (by quantities) concerning each raw and manufactured material: opening inventory, receipts, transfers from and to other locations, consumed or shipped and closing inventory. This report supports the quantity entries appearing in the detail material accounts maintained by the cost department. Finished product is weighed by weightometers as it comes out of the tube mills on its way to the bins. For the most part, the daily consumption of raw materials and work in process is arrived at by means of estimates, predicated upon the clinker or bulk cement produced. The monthly totals of these daily figures are subject to adjustment as the physical inventories are taken. The material accounts kept by location permit of a final quantity adjustment as each pile or bin becomes exhausted.

The tremendous wear and tear on machinery in a cement mill and the continuous operation thereof demand that the storeroom be well stocked at all times, so that there will

PAGE NO ________

PAY ROLL FOR PERIOD ENDING ____________ 19____

EMPLOYEES NO	NAME	OCCUPATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TOTAL HOURS	RATE PER HR.	AMOUNT	ACCOUNT NO.	TOTAL WAGES		DEDUCTIONS		TOTAL WAGES DUE	NO. OF CHECK
																						THIS NO.	TRANSFERRED	EXPLANATION	AMOUNT		

Exhibit A

be no delay in supplying repair parts. In view of the large value represented by these stores, it is necessary that a complete and accurate set of card records be kept in the storeroom, showing description, quantity, price, receipts, issues, etc., in respect of each class of material. Stores should be issued only on requisitions signed by authorized employees. A monthly summary of stores issued, classified by accounts chargeable, is prepared by the storekeeper and rendered to the cost department. It is advisable that the accuracy of the quantities on hand, as disclosed by the card records, be verified by physical counts spread over the year, thereby minimizing the inventory adjustment at the end of each year. At stated intervals the store's inventory should be reviewed by the management, in order to eliminate and charge off any obsolete parts included therein.

III—Overhead

Numerous methods of prorating burden are in use, each of which has its own peculiar merits. In the writer's opinion, however, the bases used should be as simple as possible, consistent with an equitable distribution of the charges. The undernoted bases are recommended for spreading the overhead accounts contained in the accompanying card of accounts.

a—Power, light and water (all "H" accounts). Ratio of boiler horsepower hours in the different departments.

b—Repairs to tracks, trestles, etc. (J-1). Distributed to incoming and outgoing materials, based upon the yardmaster's car movement report.

c—General repairs, salaries and other indirect expense (J-2 to 12 inc.). Direct labor ratio.

d—Stores handling (J-13). Spread on ratio of charges to the various accounts from the monthly distribution of stores issued.

In addition to the foregoing, certain accounts of an overhead nature are included under the clinker grinding group, viz.: provision for depreciation, insurance, local taxes, mill shut-down and overhead transferred to construction. While all or part of these charges might possibly be allocated to the various departments, any basis of distribution would, of necessity, be rather arbitrary. The writer believes that the management is more interested in viewing the total of each of these items, rather than to have them spread over departments. They appear under clinker grinding in the card of amounts for no better reason than that it is the last process of manufacture.

The total depreciation set aside each year should be based upon percentages of the various kinds of fixed assets; in order to spread this annual provision fairly over the year it is well to calculate the depreciation per barrel of cement produced (total yearly depreciation divided by the plant's productive capacity) and to multiply this figure by the number of barrels produced during the month, the result being that month's depreciation provision. By this means the months of high production are charged with a relatively large amount of depreciation, and vice versa. If, at the end of a year, by reason of low production, the full amount has not been set up through the monthly entries, the amount of the deficiency should be credited to the reserve as a closing adjustment.

Some readers may argue that such an adjustment need not be made in a year of low production, since the wear and tear on the plant would not be as great as in a full production year. In this connection, it should be borne in mind that in most cement mills machinery and equipment is usually discarded on account of being superseded by new and more efficient equipment long before it has become worn out. Furthermore, the Treasury Department requires that, for income tax purposes, the depreciation provided from year to year be based upon a consistent plan, through the use of percentages varying according to the class of asset. In the final analysis, where a plant is kept at a high degree of operating efficiency, the effects of wear and tear are made good by current repairs, and the main purpose of the reserve for depreciation is to take care of that most uncertain and intangible influence which is always at work—obsolescence.

The reserve for mill shut-down expense is intended to absorb all the expenses and overhead of the mill during the annual shut-down for major plant repairs. The monthly provision therefore should be the month's production multiplied by a per barrel rate (based upon past experience).

In some plants where a considerable amount of construction work is being performed under the supervision of one or more of the plant authorities, a portion of their salaries is charged to the several jobs under construction and capitalized. This treatment is optional, as the full salaries could as well be charged off through overhead, on the ground that the plant officials are required to supervise the daily operations of the mill whether or not any construction work is going on.

In connection with quarry stripping (A-14), when this work is being conducted on a large scale the accumulated charges should be deferred and charged to quarry costs over a period of time, based upon an estimate of the amount of rock made available by the stripping.

IV—Card of Accounts

Quarry

A- 1	Operating salaries
A- 2	Operating wages
A- 3	Repair and maintenance materials
A- 4	Repair labor
A- 5	Oils and waste
A- 6	Explosives
A- 9	Power, light and water
A-10	Coal for power
A-13	Provision for quarry depletion
A-14	Stripping labor

Raw Grinding

B- 1	Operating salaries
B- 2	Operating wages
B- 3	Repair and maintenance materials
B- 4	Repair labor
B- 5	Oils and waste
B- 7	Coal for drying
B- 9	Power, light and water
B-10	Coal for power
B-11	Mill expense
B-12	Repairs to buildings
B-50	Quarry rock
B-51	Limestone
B-52	Silica sand

Coal Grinding

C- 1	Operating salaries
C- 2	Operating wages
C- 3	Repair and maintenance materials
C- 4	Repair labor
C- 5	Oils and waste
C- 8	Coal for clinker burning
C- 9	Power, light and water
C-10	Coal for power
C-11	Mill expense
C-12	Repairs to buildings

Clinker Burning

D- 1	Operating salaries
D- 2	Operating wages
D- 3	Repair and maintenance materials
D- 4	Repair labor
D- 5	Oils and waste
D- 9	Power, light and water
D-10	Coal for power

MILL NO.______ COSTS

ACCOUNT	QUARRY ROCK		RAW GRINDING		COAL GRINDING		CLINKER BURNING	
	Quarried .... Net Ton		Raw Mat'l. Ground Q. R. .... Net Ton L. S. .... Net Ton		Coal Ground .... Net Ton		Clinker Burned .... Bbls.	
	Amount	Per Ton	Amount	Per Bbl. Clinker	Amount	Per Bbl Clinker	Amount	Per Bbl. Clinker
Quarry Rock								
Limestone								
Gypsum								
TOTAL MATERIALS								
Operating Salaries								
Operating Wages								
Repairs & Maintenance								
TOTAL LABOR								
Explosives								
Repair Mat'l. inc. Tools								
Oils and Waste								
Coal for Power								
Coal for Drying								
Coal for Clinker Burning								
TOTAL SUPPLIES								
Power, Light and Water								
Mill Expenses								
Repairs to Buildings								
TOTAL EXPENSES								
MANUFACTURING TOTAL								
Quarry Depletion								
Insurance								
Taxes (Local)								
Depreciation								
Mill Shut-down Expense								
Overhead transf. to Const.								
TOTAL PROVISIONS								
DEPARTMENT TOTALS			Raw Mat'l Cost		Pulverized Coal Cost inc. Coal		Clinker Burn. Operating Cost	
TOTAL MILL COST					TOTAL CLINKER COST			

	COMPARATIVE DEP'T. COSTS PER BARREL			QUARRY ROCK		
	This Month	Last Month		Net Tons	Amount	Per
Raw Grinding			Inventory first of month			
Coal Grinding			Produced or Purchased			
Clinker Burning			TOTAL			
Clinker Grinding			Consumed during month			
Reserves, etc.			Inventory end of month			
Differences in Clinker Costs						
TOTAL						

PACKAGES, PACKING AND LOADING COSTS

	CURRENT MONTH				..........MONTHS END	
	TOTAL	IN COTTON	IN PAPER	IN BULK	TOTAL	IN COTTO
BARRELS SHIPPED						
Container						
Packing Labor						
Packing Supplies						
Royalty						
Repair Labor and Material						
Oils and Waste						
Miscellaneous Expenses						
TOTAL						

(Exhibit B)

FOR THE MONTH OF ____________________ 19____

CLINKER GRINDING		TOTAL	CLINKER INVENTORIES		CEMENT (this month)		CEMENT (to date)	
Clinker Ground .... Bbls.			Clinker On Hand and in Process First of mo. .... Bbls. End of mo. .... Bbls.		.... Bbls.		.... Bbls.	
Amount	Per Bbl. Cement	Amount	Value first of mo.	Value end of mo.	Amount	Per Bbl. Cement	Amount	Per Bbl. Cement
Clinker Grind Operating Cost								
			No. 2 Cement	Bbls.				
				TOTAL CEMENT COST				

SUMMARIES

	LIMESTONE			CLINKER			BULK CEMENT		
Ton	Net Tons	Amount	Per Ton	Barrels	Amount	Per Bbl.	Barrels	Amount	Per Bbl.

COST OF CEMENT SHIPPED

ED				CURRENT MONTH		.... MO. ENDED	
N	IN PAPER	IN BULK		AMOUNT	PER BBL.	AMOUNT	PER BBL.
			Bulk Cement				
			Packing and Loading				
			Overhead				
			Mill Cost				

D-11 Mill expense
D-12 Repairs to buildings

Clinker Grinding

E- 1 Operating salaries
E- 2 Operating wages
E- 3 Repair and maintenance materials
E- 4 Repair labor
E- 5 Oils and waste
E- 9 Power, light and water
E-10 Coal for power
E-11 Mill expense
E-12 Repairs to buildings
E-20 Provision for depreciation
E-21 Insurance
E-22 Local taxes
E-23 Provision for mill shut-down
E-24 Overhead transferred to construction
E-25 Gypsum
E-26 Clinker

Packing and Shipping

F-1-c Packing labor, materials and supplies (cotton)
F-1-p Packing labor, materials and supplies (paper)
F-1-b Packing labor, material and supplies (bulk)
F-1-g Packing labor, materials and supplies (general)
F- 2 Repairs and maintenance labor and materials
F- 3 Salaries—clerks
F- 9 Power, light and water
F-12 Repairs to buildings
F-27 Royalty
F-28 Bulk cement

Materials (including freight and handling)

G- 1 Limestone
G- 2 Gypsum
G- 3 Silica sand
G- 4 Quarry rock
G- 5 Clinker
G- 6 Bulk cement
G-7-c Cement shipped in cotton
G-7-p Cement shipped in paper
G-7-b Cement shipped in bulk
G-10 Gas coal
G-11 Bituminous steam coal
G-20 Dynamite
G-21 Black powder
G-22 Exploders
G-23 Fuses
G-24 Caps
G-25 Connecting wire
G-30 Yarn
G-31 Cotton sacks valved only
G-32 Cotton sacks valved and tied
G-33 Paper bags
G-34 Twine
G-35 Wire ties
G-36 Paper for car floor
G-40 Stores

Power, Light and Water

H- 1 Chief engineer and consultant's salaries
H- 2 Operating wages
H- 3 Repair and maintenance material
H- 4 Repair labor
H-10 Coal for power
H-12 Repairs to buildings
H-35 Electricians—labor and materials
H-36 Operating labor—water
H-37 Repair and maintenance labor and material—water

Miscellaneous Overhead Accounts

J- 1 Repairs to tracks, trestles, R. R. cranes and scales
J- 2 Repairs to buildings—general
J- 3 Auto repairs
J- 4 General outside repairs
J- 5 Company houses (expenses less income)
J- 6 Miscellaneous indirect wages and expenses
J- 7 Operating salaries
J- 8 Dispensary salaries and expenses
J- 9 Watchmen's wages
J-10 General office expense
J-11 Commissary
J-12 Shop repair and maintenance expense
J-13 Handling of stores

V—Co-ordination of Costs

A separate ledger account is kept by the cost department for each account called for in the card of accounts, the sheets for materials ("G" group) being specially ruled with quantity as well as money columns. The accounts covering raw materials, such as limestone and coal, are charged with the suppliers' invoices, freight, labor handling, proration from account J-1, etc. The quarry rock account (G-4) obtains its charges from the "A" group, which will represent the cost of the rock quarried during the month. A credit is then passed to account G-4 and a corresponding charge made against B-50 (under raw grinding) for the value of so much of the rock as was ground during the month. Similarly, the account for clinker under the material group (G-5) is charged with the monthly balances of all accounts in groups "B," "C" and "D," giving the cost of clinker produced. Account G-5 is credited and E-26 is charged with the value of clinker ground. The total of the "E" group covers the bulk cement produced and is carried to G-6. Finally, the value of cement shipped is passed to account F-28 and the total of the "F" group, carried to the three G-7 accounts, represents the cost of goods sold.

To sum up, the balances from all other groups must be transferred to some account in the "G" group at the end of any month, and the balances then remaining in the "G" accounts represent the closing inventories of raw materials and manufactured product.

A form of cost sheet is submitted herewith as Exhibit B, which can readily be prepared from the information contained in the cost ledger. Provision is made in this sheet for the inclusion of opening, and the elimination of closing, clinker inventories, in order to arrive at total and per barrel costs, in terms of bulk cement produced during the month.

Some cement companies are in the habit of including selling and administrative expenses in their costs. While it is entirely in order for a company to prepare a supplemental monthly statement, showing total and per barrel cost and profit, after giving effect to selling and administrative charges, the writer is firmly of opinion that the nature of these expenses is such that they are quite unrelated to fluctuating monthly costs. They, therefore, have no place in a cost statement proper and should not be allowed to creep into inventory values.

Oita Cement Company Shows 1926 Profit

The Oita Cement Company, one of the largest cement companies in Japan, has absorbed the Sakura Cement Company. The former company issued 21,333 shares, 50 yen paid up each, and increased its capitalization by 1,066,650 yen in connection with the absorption. The semi-annual reports to shareholders show that the Oita Cement Co., made a profit of about 60 sen per barrel in 1926. This company, however, has been in difficulties for a long time, and only succeeded in readjusting its debts last year so that its annual interest payments were materially reduced. The Sakura Cement Co., turning out 1,300 barrels a day, with a productive capacity of 1,800 tons a day, is in an especially favorable location for production and shipping; its lime deposits are only 600 feet removed from the mills, and the mills are located on an arm of the sea where ships of 1,000 tons burden can anchor with safety. With these advantages costs of production should be low, but due to over-expansion of equipment, its fixed capital investment is 1,125,000 yen in excess of paid-up capital, and as this difference is covered by high interest bearing loans, its cost of production is almost as high as the selling price. The merger goes a long way to consolidate the business foundation of the Oita Cement Co.

Causes of Discoloration of Clinker

Some Observations on Tests Made to Determine the Causes of Clinker Discoloration and Its Effect on the Quality of Cement

By H. SHRODER
Works Superintendent, Kandos Cement Company, Ltd., Kandos, N. S. W.

An article on the subject of discoloration of clinker was published in the Mill Section of "Concrete" for April, 1926. That discussion created considerable interest and comment.

The subject is still of absorbing interest and the following article, describing some tests made at the plant of the Kandos Cement Company, Ltd., at Kandos, New South Wales, will throw further light on this subject.

EARLY in 1924 we began to get a discoloration of clinker and the occurrence coincided with a change in the quantity and quality of the water used for cooling the clinker and with an increased clinker production.

At the Kandos plant, clinker coolers are not used, the kilns discharging direct into a Jeffrey-type bucket conveyor, which, after traveling under the last kiln, meets jets of water which cool the clinker preparatory to its being delivered to clinker pile. The change of cooling water was from a local supply to a supply from our condenser spray cooling dam, this water containing 1800 parts solids per 1,000,000.

The theories advanced as to the reason for the discoloration of the clinker were:

1. That there was insufficient draft to burn all coal fired into the kiln, which coal, therefore, burned with a reducing flame, producing the lower oxide of iron which gave the discoloration when water was added to the clinker.

2. That the impurities in the water from the cooling dam produced the discoloration.

3. That coarse coal in the coal feed produced smoked clinker.

A series of simple experiments were undertaken to prove or disprove some or all of these theories.

Two samples of clinker, A and B, were taken from No. 3 kiln.

A. Clinker was cooled slowly in air. No discoloration apparent, clinker hard, Grade 12. (Normally burnt sound clinker is taken as Grade 10 and Grade 12 is hard-burned.) After cooling to atmospheric temperature the clinker was soaked in water and no discoloration was visible.

B. Clinker was quenched at a red heat by pouring cold cooling dam water upon it. Discoloration very pronounced but clinker did not break down.

Samples 1, 2 and 3:

(1) Clinker from kiln No. 3 cooled slowly in air. No discoloration. Clinker apparently sound. Grade 12.

(2) Clinker quenched in distilled water. Discoloration pronounced.

(3) Clinker quenched in dam water. Discoloration pronounced but no more so than in (2).

Samples 4, 5 and 6:

(4) Clinker from kiln No. 3, Grade 9. Slowly cooled in air. O. K.

(5) Clinker quenched in distilled water. Discoloration very pronounced. No breaking down.

(6) Clinker quenched in cooling dam water, less discoloration than in experiment (5) but quenching done at lower temperature.

Samples 7 and 8:

(7) To prove appearance of smoked clinker. About 5 grams of fine coal were poured on sample of clinker. It was impossible to discolor clinker until well below red heat. Above this temperature the coal was completely burned without smoking. The appearance of the discoloration was not materially different from that produced by quenching.

(8) Normally cooled sample to compare with No. 7.

Sample (9): To determine if discoloration was due to quenching in water or was due to cooling from a high temperature rapidly, a test was made by placing a sample of clinker direct from kiln upon a thin plate cooled from below by a stream of water. The discoloration, though not so pronounced as in the cases where sample was immersed in water, was produced on clinker in immediate contact with the cool plate. The difference in discoloration was probably due to the less rapid cooling in this experiment. Conclusion derived therefore, is that cooling, and not water, produced the yellow discoloration.

Sample (10): Hard sample from kiln 4 drawn very quickly from kiln and immediately plunged into body of cold water. In the previous experiments the water had been poured upon the clinker, thus producing a less rapid quenching. In this case, the discoloration was much more pronounced than in any case except experiment 5. This led to the idea that temperature from which the clinker was cooled might have some effect.

Samples 11, 12, 13 and 14:

These were drawn from kiln and quenched at the following periods after withdrawal, so obtaining a graduation in temperature 5 secs., 10 secs., 15 secs., 20 secs., respectively. These show a distinct graduation in discoloration produced, the clinkers quenched at the higher temperatures showing the greatest amount of discoloration. The last experiment showed no discoloration at all. Quenched at bright cherry red. No breaking down apparent in any specimens.

Conclusions

From the above experiments the following conclusions were:

(1) That discoloration occurs whether distilled or cooling dam water be used; therefore impurities in water cannot be responsible for discoloration.

(2) That discoloration is not due to smoked clinker, as slowly cooled samples show no discoloration, and also that it was impossible to produce discoloration with coal upon hot clinker, and clinker must be quenched at high temperature to show discoloration. Experiments 7 and 15.

(3) As coal feed to kilns was reduced to an absolute minimum and draft increased to maximum possible during the experiments it is not feasible that a reducing flame could have been present, therefore discoloration was not due to lower oxides of iron. Again as discoloration is produced by cooling out of contact with water and as well protected from air as conditions permitted, discoloration of clinker can hardly be due to oxidation, especially as slow cooling does not show any defect in clinker even though freely exposed to the atmosphere.

(4) Rapid cooling from high temperature would seem to be the cause of the discoloration from experiment 9, 10 and others. Slow cooling produced no discoloration.

(5) All clinkers tested would appear to be sound as the quenching in water produced no apparent change in the hardness of the clinker and no breaking down was apparent.

(6) From experiments 11 to 14 the temperature at which cooling begins apparently influences the amount of yellow material produced. As clinker was quenched at lower temperatures the discolored material produced was successively less. The highest temperature at which it was possible to quench without producing discoloration was a bright cherry red, much hotter than the maximum temperature at which it was possible to coal smoke clinker.

From the above it appears probable or at least possible that there is at least one of the constituent compounds of clinker which turns yellow when quenched from a very high temperature. Possibly this is the dicalcic silicate which is known to have two forms of crystallization.

In view of the information set out in the experiments, the following appears feasible.

The reason for the greater quantity of discolored clinker visible when all kilns are in operation is that the buckets of the conveyor being filled more, the clinker carried in the center of the buckets is held at a much higher temperature than at other times. The quenching action of the water for cooling would then be much greater, especially as the quantity used for four kilns is considerably increased because of the men wheeling on the clinker gantry. This would also explain why some lumps of clinker are colored on one side and black on the other. The black side has had most opportunity to cool and therefore is not discolored.

It has been pointed out that some plants run their clinker direct into water pits and yet have no discoloration. We burn much closer to the mouth of the kiln than is usual. By burning further back the clinker is given a much greater opportunity to cool before emerging from the kiln, so eliminating any chance of discoloration. In support of this it has been shown that a kiln which has been warming up, which means a cooling of the front of the kiln, delivers clinker which does not so markedly exhibit the tendency to discolor.

Cement from Discolored Clinker

To prove whether or not cement made from discolored clinker is as sound as that made from black clinker, the following series of experiments were carried out:

(1) Fifteen pounds of normal clinker which had been exposed to air for 21 days were milled together with 7.5 ounces gypsum for three-quarters of an hour. Fineness of product: 83.85 per cent through 200-mesh sieve.

(2) Twenty pounds of quenched clinker taken at the same time as clinker for No. 1 sample were exposed to air for 21 days and then milled with 10 ounces of gypsum. Fineness of product: 83.5 per cent through 200-mesh sieve.

	—Sets, hrs.—		——Pats——		Expansion, mm.	
	Initial	Final	Made	O. K.	A	B
Normal 1	4½	7	3	3	1.0	1.5
Quenched 2	4:00	7	3	3	1.5	2.0

	Normal Clinker	*Quenched Clinker*
Residues		
120-mesh	5.5%	6.0%
180-mesh	11.5%	14.5%
Setting		
Initial	5 hrs. 15 mins.	4 hrs.
Final	7 hrs. 30 mins.	7 hrs.
Neat Briquettes—Tensile		
7 days cold	840 lbs.	1100 lbs.
7 days hot	612	767
28 days cold	1150	1080
Sand Briquettes—Tensile		
7 days cold	250 lbs.	355 lbs.
7 days hot	320	255
28 days cold	322	355
Sand Compression		
Water 27 days	2150 lbs.	3950 lbs.
Water 6 days, air 21 days	3000	5350
Soundness		
Pats O. K.	100%	100%
Expansion Le Chatelier	1.25 mm.	1.75 mm.

From the above it would appear that

(1) Discoloration of clinker is due to rapid cooling of the clinker from a high temperature either in air or water and is not due to
   (a) Impurities of the cooling water
   (b) Smoking of the clinker
   (c) Reduction or oxidation of the iron compounds.

(2) Slow cooling produces no discoloration.

(3) All clinkers do not break down when quenched in water.

(4) Discolored clinkers are perfectly sound.

(5) The strength of discolored clinkers is not less than that of otherwise similar clinkers which have not been discolored and, in fact, the tests actually performed show a considerably higher strength in clinkers so discolored, probably due to molecular or crystalline changes in the clinker structure.

(6) Any clinker, no matter how well burned, can be discolored by quenching at a sufficiently high temperature.

In reference to discolored clinker, I mean one in which discoloration has been produced by rapid cooling but which otherwise appears to be quite normal. Of course, the above remarks do not apply to clinker which is obviously underburned.

EDITORIALS

Cement Imports

EFFORTS to combat the importation of foreign cement are bringing results. The Department of Commerce statistics testify eloquently to the truth of this statement. Cement imports for the first six months of 1927 are 51 per cent under those for the same period in 1926. Only 975,507 barrels were imported during the first half of 1927 as against 1,983,941 barrels during the first half of 1926.

Several cement manufacturers whose trade area is largely in the foreign competitive zones have, for some time, been active in creating sentiment in favor of American made products. They have distributed booklets and delivered addresses that have been the inspiration for editorials in newspapers in the territory served by their mills. They have appealed to the buyer on the simple, common-sense basis of the economic effect on him and his business of buying foreign made products, rather than basing their appeal simply on patriotism.

In the absence of other, easier, means of arriving at their ends, the tactics adopted have brought favorable results, though the cost in money, time and effort has been considerable for manufacturers who have been most interested.

□ □ □

Predicting Cement Performance

OUT of the great amount of research that has been done on the constitution of portland cement during the last few years, one very important conclusion has emerged. This is the now generally accepted hypothesis that the cementitious properties of the clinker are the result of the dicalcium silicate and tricalcium silicate contained in it. In a general way the tricalcium silicate is assumed to be responsible for high early strengths, and the dicalcium silicate for the increase of strength after the first seven days.

On the basis of this hypothesis new proportioning formulae have been developed, and new methods of interpreting the conventional chemical analysis of a cement have begun to receive consideration. Two methods of reducing an analysis in terms of oxides to one in terms of di- and tricalcium silicates and other compounds assumed present in portland cement have already appeared in the pages of this journal, and other methods to the same end will doubtless be proposed from time to time.

There is still much difference of opinion as to just what all this has to do with the practical business of making cement, however, and there is much valid doubt as to the extent to which an interpretation of any given cement analysis must be modified in consideration of details of the manufacturing processes back of it.

In the work of clearing up this situation the individual cement mill chemist can do much. He can apply the various methods of interpretation to the analysis of his own cement, and see for himself how well the conclusions reached fit with the known performance of the product. If he finds that the theoretical forecast of his cement's performance differs from the facts, he may find it interesting to examine the manufacturing processes of his plant, and see if he can discover any logical reason for the observed discrepancy.

It is only by hundreds of such observations, and the comparison of the findings of many widely separated workers that the practical value of the new theories can finally be determined. Imperfect as the present means for comparing such conclusions are, it seems worth the effort. The pages of ***Concrete*** will at all times be open to any new bit of evidence that anyone in the industry may turn up, and it is our hope that the coming year will see many interesting individual investigations reported for the benefit of the industry as a whole.

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Localizing Cement Supply

DEVELOPMENTS in the cement industry point toward a growing tendency to localize cement supply. New plants are narrowing the trade areas of many of the older plants.

Economical distribution of the finished product has been the greatest consideration influencing the locations of the cement plants built during the past few years. Almost without exception they have been so located that they have a decided advantage over the older plants in supplying the larger local markets.

The rapid growth of the demand for cement has influenced this development. No longer need cement manufacturers depend upon a large area for a market sufficiently large to absorb the output of their plants. The market available in many of our larger cities is sufficient to take care of the production of an average cement plant. Naturally, that plant having the most economical distribution facilities will enjoy a decided advantage.

The tendency seems to be to erect more smaller plants, each plant aimed at a definite local market, rather than to build larger plants at some central point in a large trade area. Raw materials for cement are available in many forms and in many locations. Is it not improbable that, as the demand for cement increases, each local trade area will be served by a small cement plant so designed that it can be enlarged as the market expands?

MEN and MILLS

Notes from the Field

Richard Hardy Dies in New York City

Hardy Forceful Character in Industry, Particularly in South, for Twenty Years

The sudden death of Richard Hardy, of the Pennsylvania-Dixie Cement Corporation, occurred in Roosevelt Hospital, New York City, on Sunday, August 14th, as a result of heart trouble. He was chairman of the Board of Directors of the corporation.

Mr. Hardy was a native of Michigan, and for a number of years was engaged in educational work, and later in the insurance business as an executive. In 1907 he helped to organize the Tennessee Cement Corporation at Chattanooga. Here he became interested in civic affairs and in 1923 was elected mayor of Chattanooga to fill an unexpired term. He retired from this work last April.

Early in 1926, Mr. Hardy began negotiations to form what is now the Penn-Dixie Corporation, involving a capitalization of about $40,000,000. It was last October that he became chairman of its board. Since that time he had lived in New York.

One of Mr. Hardy's achievements was the erection of a completely equipped school for the education of children of plant employees, at a cost of about $300,000, provided by the corporation.

Burial took place at Chattanooga.

Penn-Allen Appoints New Superintendent

Superintendent Howard W. Gilbert of the Penn-Allen Cement Company, near Bath, Pennsylvania, was succeeded on August 1st by Floyd Walter of Nazareth. Mr. Gilbert had been with Penn-Allen for twenty-one years.

New Signal Mountain Sales Manager

Mr. J. A. Hudson, for some time sales manager of the Signal Mountain Portland Cement Company, at Chattanooga, Tenn., has resigned, according to an announcement. Mr. Hudson will be succeeded by Frank G. Conkling, who has served as assistant sales manager for several months.

Colorado Superintendent Resigns

E. J. Strock, superintendent of the Colorado Portland Cement Company, Portland, Colorado, resigned July 28. He is undecided as to his future location, but is considering California and the East.

Arnold Leaves Southwestern

Mr. T. H. Arnold, formerly electrical engineer for the Southwestern Portland Cement Company, has joined the General Fireproofing Company, at Youngstown, Ohio, as plant engineer.

Alabama Bill Would Prohibit Use of Foreign Cement in State Work

The state of Alabama has taken legislative action requiring material used in the construction of state highways, bridges, and other structures. Only cement and other materials manufactured in the United States and labor furnished by citizens of the United States would be used. The bill has been introduced, but its present status is not yet known.

It also requires that cement used on such projects shall be furnished and contained in cotton bags manufactured in this country.

Fort Collins Plant to Open During September

Although the plant will not be completed until the end of the year, production will start in September at the Fort Collins plant of the Colorado Portland Cement Company. The location would seem to have been well chosen. Close to the plant is an unlimited amount of Niobrara shale containing about 80 per cent of limestone. Natural gas fields abound in the vicinity.

With the new plant occupying much of the local public mind and eye, old citizens of Fort Collins recollect when Charles Boettcher, president of the Colorado Portland Cement Company, began his business career in Fort Collins as a hardware merchant, in 1872.

Universal to Add New Turbine at Buffington

The Universal Portland Cement Company will shortly spend slightly less than $1,000,000 for a new turbine for its No. 4 mill, at Buffington, Indiana. The equipment will generate power to operate the mill and waste heat boilers. It will also help to eliminate much of the dust about which there has been some agitation in the vicinity.

Cowham Organizes Own Investment Department

The Cowham Engineering Company, Chicago, has organized an investment department, known as Butler, Senior and Company, specializing in cement stocks and underwriting securities of allied industries.

Francis P. Butler was formerly vice-president of Peabody, Houghteling & Co., a large Chicago investment firm, Mr. Senior is president of the Cowham Engineering Company.

"Quikard" is New Ash Grove Cement

The Ash Grove Lime and Portland Cement Company, Ash Grove, Missouri, has entered in the field of quick-hardening cements, "Quikard." It is a twenty-four hour cement and meets all goverment and A. S. T. M. specifications. The product was used in a Chanute, Kansas, street, and fulfilled expectations.

Chief Chemist of Atlas Plant Dies

Richard Edger Richart, 42, chief chemist at the Hannibal, Missouri, plant of the Atlas Portland Cement Company, died in Mayo Brothers hospital in Rochester, Minnesota, on August 3.

He became associated with the Atlas plant in 1905 and was made chief chemist about two years ago.

Sandusky to Have New Gray Cement Plant

The Sandusky Cement Company has begun erection of a unit for the manufacture of gray cement as an addition to the firm's white cement plant in West York, Pennsylvania. It is expected that the new unit will be complete in about eight months.

The cement industry burlesqued. This is one of a series of travesties by an English artist and published in a Great Britain builders' magazine as the educational advertising of G. & T. Earle, Ltd., cement manufacturers. Below the illustration in the advertisement are printed a few words explaining the operation shown

Chemist Joins Brazilian Cement Company

John Eschen, cement chemist of Northhampton, Pennsylvania, has accepted a position in South America, with a Brazilian cement company. He will remain in South America for several months.

Penn-Dixie Contracts for 28 Silos

The Pennsylvania-Dixie Cement Corporation has let a building contract for a group of 28 silos for cement storage at Nazareth, Pennsylvania, to the Turner Construction Company, Buffalo, New York. Work will begin at once. The Spencer Construction Company are the engineers for this structure.

Alpha Mill Holds Unique Demonstration

A safety first demonstration in a different form was held recently at the Alpha Portland Cement Company's Mill No. 4, at Martin's Creek, Pa. The plant has had a perfect record since the inauguration of the safety campaign on June 1st.

Two men carrying two silk flags were followed by another pair carrying a stretcher on which lay a caricature of Old Man Accident. These men were followed by members of the safety committee, carrying signs. Other employees followed these.

The group marched through each department in the plant and through the main street of the village, later returning to the plant where short addresses were made. Music was furnished by a drum corps and an Italian band.

Safety Council Cement Session in Chicago, September 27th

The Cement Session of the sixteenth annual safety congress, sponsored by the National Safety Council, will be held at the Stevens Hotel, Chicago, on September 27th to 30th.

On Tuesday morning, J. B. John, president of the Sandusky Cement Company will deliver an inspirational address. W. P. Sabin of the Ash Grove Lime and Portland Cement Company will speak on "How to Interest Workmen in Their Own Safety."

At the Cement and Quarry session following, in the afternoon, W. L. White, Jr., of the Sandusky Cement Company and W. H. Weitknecht of the Lehigh Portland Cement Company will discuss "Fixing Accident Responsibility." A. J. R. Curtis, assistant to the general manager of the Portland Cement Association, will dwell on the subject of "Technical Study of Cement Plant Accidents."

An informal dinner will be held on Tuesday at 6:30 P. M.

Wabash Withdraws Gold Notes

The Wabash Portland Cement Company, Detroit, Michigan, will redeem a majority of its 6 per cent gold notes on September 15th. They were issued in March, 1927, and a premium of 1 per cent upon the principal will be paid.

Private Orders Cancelled in Favor of State Plant

Instead of sustaining an operating loss for the present year or closing the Chelsea, Michigan, plant, Gov. Fred W. Green has cancelled orders for 110,000 barrels of cement for state use given to independent manufacturers by the previous administration.

In reply to the protests of privately owned plants, Governor Green stated that inasmuch as the state is manufacturing cement, it should use its own product.

Erection of Colorado Silos Sets Record

A record was set by the Colorado Portland Cement Company in the construction of twelve silos at its new Fort Collins plant. Using Ideal brand cement, the storage for 200,000 barrels of cement was completed in seven days and nights, using two shifts of seventy-five men each.

Oklahoma Portland Cement Co. Plant for White Cliffs

The Oklahoma Portland Cement Company of Ada, Oklahoma, has purchased 50 per cent of the common and preferred stock of the Graysonia, Nashville, and Ashdown railroad. The line passes directly through chalk formation at White Cliffs, where the company has acquired large holdings for a proposed $3,500,000 cement plant with a capacity of 1500 barrels daily, to be completed in June, 1928. General offices will be at Little Rock.

The plant is the seventh to go into operation under the ownership and control of the Boettcher interests of Denver. The officers are as follows: Charles Boettcher, president; C. D. Nichols, vice-president; Philip Thompson, secretary, and M. O. Matthews, treasurer.

Bad Weather Fails to Halt Use of Bessemer Cement

Cement shipments of the Bessemer Limestone & Cement Co. are ahead of the same period last year despite backward weather conditions which held up building. The rate of increase during the remainder of building season is expected to be much higher than in 1926. The company's plant at Bessemer, Pa., is operating at capacity. Newly operated plant of the Federal Cement Co., at Buffalo, which started June 1, is at 70 per cent capacity. The regular dividend of 75 cents per share on "A" stock, payable August 1 to stock of record July 20, was declared.

Contractor Wins Suit for Cement Plant Stock

That John F. Hurley, Boston contractor, is entitled to five hundred shares of stock in the National Cement Company for services in assisting in the promotion of the National Cement Corporation was allowed in a Superior court session in Boston recently.

The suit was brought against Emelie Laplante, executor of the estate of Isaie Laplante, Fall River, Arthur B. Cartier, Fall River, and Edmond Cote, Fall River. Hurley sued to recover the stock from Laplante's estate under an alleged agreement of the late Mr. Laplante to compensate him for helping him in promoting the company.

Increase in Imports Seen

Notable increases in the imports of cement are disclosed in the report of the Commissioners of Navigation of the Port of Philadelphia for July. Shipments of foreign cement to Philadelphia in that month amounted to 156,227 bags, an increase of 38,401, or 33 per cent.

Merced Plant Working; Stock Sold Out

Production of cement began on July 24th at the Yosemite Portland Cement Corporation plant near Merced. The mill will turn out 2,700 barrels a day.

The entire issue of stocks has been sold, largely to residents of the San Joaquin Valley. The authorized capital of the company is $3,500,000, divided into $2,000,000 class A common stock and $1,500,000 class B common. The former carries an 8 per cent cumulative dividend and is entitled to 30 per cent of all dividends in excess of the 8 per cent requirements.

The class A stock has been just recently placed on the market, class B stock going to the organizers of the company. After a reasonable time it is expected that the class A stock will be offered for listing on San Francisco and Los Angeles stock exchanges.

Edward G. Tallerday, vice-president and general manager of the Western Pipe and Steel Company and Frederick Thompson, vice president of the Pacific Electric Manufacturing Company, were recently elected to the board of directors, in the course of a meeting of that group.

"Carl D. Bradley" Transports Limestone to Buffington

The biggest ship that has as yet churned the water of the Great Lakes, bearing the largest cargo ever carried on the lakes, completed her maiden trip Saturday, July 30th, when the steamer, Carl D. Bradley, nosed her way into the new Buffington Harbor, Indiana, the largest industrial harbor on the Great Lakes. The boat at once began to discharge her own 15,000-ton load of limestone at the rate of a ton a second, with the automatic electrical machinery with which the ship is equipped.

The freighter was built specially to carry limestone from the quarries at Calcite, Michigan, to the Chicago plant of the Universal Portland Cement Company. The ship measures 638 feet long, 65 feet wide and 33 feet deep.

Carl D. Bradley, president of the Michigan Limestone and Chemical Company and of the Bradley Transportation Company, for whom the boat is named, is credited with developing the modern self-unloading type of freighter of which this is the newest example.

Atlas Representatives Play

A company of seventy-five Atlas Portland Cement Company representatives during July visited Excelsior Springs, Missouri. The golf tournament in which they participated is a regular event.

Pacific Gypsum Plant Destroyed by Fire

Flames of an unknown origin destroyed the gypsum plant of the Pacific Portland Cement Company, at Plaster City, California, eighteen miles west of El Centro on the San Diego highway, at 1 o'clock in the morning of August 11th. Manager H. L. Townsend estimated the loss at $250,000. All buildings connected with plant were burned except the machine shop and roundhouse.

Efforts to extinguish the flames failed when power lines operating the electrically equipped water pumps were cut off by the blaze soon after it was discovered.

Employees of the company were able to save a portion of the office records, but the main plant is almost a total loss, according to Townsend. He stated that he knew nothing regarding the amount of insurance carried by the company or its plans for rebuilding.

The mills have been in operation for the past three years, and comprise one of the most important units in the Pacific Company's system. Fifty men are thrown out of employment temporarily by the fire.

Volunteer Awards More Mill Contracts

The Volunteer Portland Cement Company, Knoxville, Tennessee, has awarded contracts for its kilns to the Vulcan Iron Works, Wilkes-Barre, Pa., and for clinker coolers, to the Traylor Engineering and Manufacturing Company, Allentown, Pa. F. L. Smidth & Company, New York City, will furnish mills for raw material and clinker, and the Fuller-Lehigh Company, Fullerton, Pa., the coal room machinery. The quarry crusher contract was awarded to the Allis-Chalmers Manufacturing Company and that for a shovel and dragline to the Bucyrus Company, Milwaukee, Wisconsin.

As announced in these pages in the August issue of CONCRETE, the Burrell Engineering and Construction Company was awarded the contract for the stock and pack houses.

John L. Senior Optimistic of Business Future

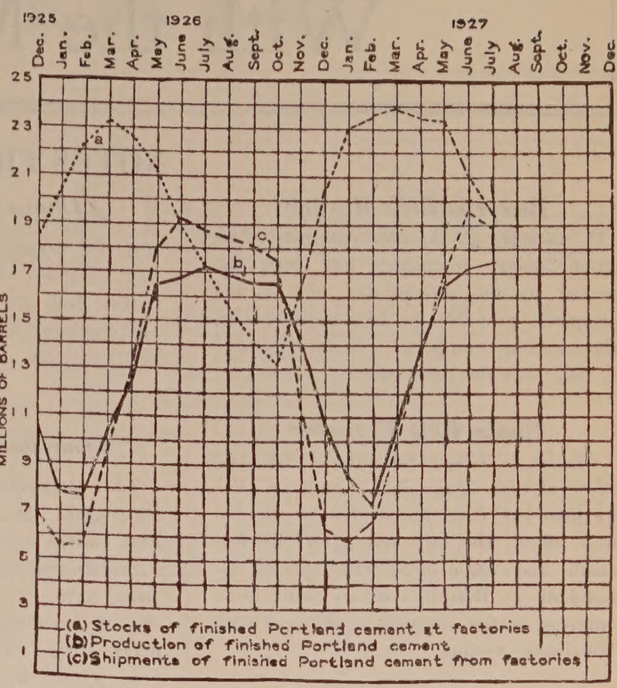
According to a statement made by John L. Senior, president of the Signal Mountain Portland Cement Company, upon his arrival in Chattanooga recently, the Signal Mountain plant is operating full time and business conditions and their outlook are favorable.

He also stated that no merger or sales of the Signal Mountain plant are contemplated, nor are any large additions planned.

Cement Statistics for July

PRODUCTION of portland cement in July has never been surpassed in any month, according to the Bureau of Mines, Department of Commerce. July shipments of portland cement are well over those of July, 1926, and have been exceeded only by those of June, 1926 and 1927. Stocks of portland cement continue to decline but are nearly 12 per cent higher than on July 31, 1926.

The output of three more new plants, located, respectively, two in New York and one in Iowa, are included.



Estimated Clinker (Unground Cement) at the Mills at End of Each Month, 1926 and 1927, in Barrels

Month	1926	1927
January	9,074,000	9,989,000
February	10,931,000	11,943,000
March	12,290,000	12,997,000
April	12,967,000	13,335,000
May	11,695,000	12,488,000
June	10,144,000	*10,892,000
July	8,604,000	9,347,000
August	7,362,000	
September	6,112,000	
October	5,370,000	
November	5,748,000	
December	7,799,000	

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*Revised.

Production, Shipments and Stocks of Finished Portland Cement, by Months and by Districts, in Barrels

Month	Production		Shipments		Stocks at end of month	
	1926	1927	1926	1927	1926	1927
January	7,887,000	8,258,000	5,674,000	5,968,000	20,582,000	22,914,000
February	7,731,000	7,377,000	5,820,000	6,731,000	22,385,000	23,560,000
March	10,390,000	11,452,000	9,539,000	11,083,000	23,236,000	23,922,000
First quarter	26,008,000	27,087,000	21,033,000	23,782,000		
April	12,440,000	14,048,000	12,965,000	14,350,000	22,710,000	23,654,000
May	16,510,000	16,674,000	17,973,000	16,859,000	21,255,000	23,482,000
June	16,866,000	*17,167,000	19,134,000	*19,731,000	19,000,000	*20,923,000
Second quarter	45,816,000	47,889,000	50,072,000	50,940,000		
July	17,134,000	17,398,000	18,812,000	18,984,000	17,301,000	19,337,000
August	16,995,000		18,583,000		15,718,000	
September	16,571,000		18,087,000		14,188,000	
Third quarter	50,700,000		55,482,000			
October	16,596,000		17,486,000		13,334,000	
November	14,193,000		11,276,000		16,243,000	
December	10,744,000		6,432,000		20,616,000	
Fourth quarter	41,533,000		35,194,000			
	164,057,000		161,781,000			

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*Revised.

Commercial District	Production—July		Shipments—July		Stocks at end of July		Stocks at end of June, 1927*
	1926	1927	1926	1927	1926	1927	
Eastern Pennsylvania, New Jersey, Md.	3,935,000	4,080,000	4,215,000	4,237,000	3,687,000	4,236,000	4,394,000
New York	911,000	1,258,000	1,146,000	1,263,000	992,000	1,482,000	1,487,000
Ohio, Western Penn., and West Virginia	1,851,000	1,909,000	2,053,000	2,056,000	2,109,000	2,806,000	2,953,000
Michigan	1,506,000	1,460,000	1,681,000	1,674,000	1,558,000	1,758,000	1,971,000
Wisconsin, Illinois, Indiana, and Kentucky	2,438,000	2,360,000	3,017,000	2,935,000	2,400,000	1,857,000	2,432,000
Virginia, Tennessee, Ala., Ga., and La.†	1,445,000	1,504,000	1,419,000	1,465,000	1,150,000	1,245,000	1,206,000
Eastern Missouri, Iowa, Minn., and So. Dak.	1,576,000	1,509,000	1,756,000	1,931,000	2,237,000	2,419,000	2,841,000
West. Missouri, Nebraska, Kan., and Okla.	1,067,000	964,000	1,160,000	1,035,000	1,362,000	1,671,000	1,743,000
Texas	459,000	458,000	464,000	472,000	472,000	316,000	330,000
Colorado, Montana, and Utah	312,000	239,000	269,000	254,000	413,000	526,000	541,000
California	1,302,000	1,264,000	1,276,000	1,241,000	508,000	624,000	601,000
Oregon and Washington	332,000	393,000	356,000	421,000	413,000	397,000	424,000
	17,134,000	17,398,000	18,812,000	18,984,000	17,301,000	19,337,000	20,923,000

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*Revised. †Began producing June, 1927, and shipping July, 1927.

With the Manufacturers

NOTES FROM THE FIELD

Bucyrus-Erie Merger

A merger of the *Bucyrus* and *Erie* steam shovel companies has been approved by the directorates, and a new company, probably to be known as the *Bucyrus-Erie Company*, will be organized to take over the properties.

Chain Belt Transfer

Charles G. Olson, formerly of the main office of the *Chain Belt Company*, Milwaukee, has been transferred to the Detroit office. He will look after the Rex chain and engineering business of the company in Detroit territory with headquarters at the company's office at 8855 Woodward Avenue.

Consolidation of Offices

The Philadelphia district offices of *Combustion Engineering Corporation, Heine Boiler Co.*, and *Ladd Water Tube Boiler Co.*, have been consolidated at 807 Bankers Trust Building, Philadelphia, Pa.

Chain Belt Director

H. O. Seymour, director of the *Chain Belt Company*, Milwaukee, died of heart failure July 23rd at Lake Geneva, Wis. Mr. Seymour was director of the Chain Belt Company since 1918.

Tracyfiers in Pittsburgh

The Andrews-Bradshaw Company, of Pittsburgh, Pa., who for some time have owned a controlling interest in the *Tracy Engineering Company* of San Francisco, have recently acquired full ownership of that company's entire plant. While many of the original basic patents were held jointly by the two companies, the purchase of the *Tracy Engineering Company* gives the *Andrews-Bradshaw Company* absolute title to all *Tracyfier* patents. The factory is now at Pittsburgh.

The *Tracyfier* organization has been augmented by the transfer of *George Ahlworth*, former plant superintendent of the *Tracy Engineering Company*, and *Carl Petersen*, chief draftsman, who is also moving east to join the *Andrews-Bradshaw Company* forces.

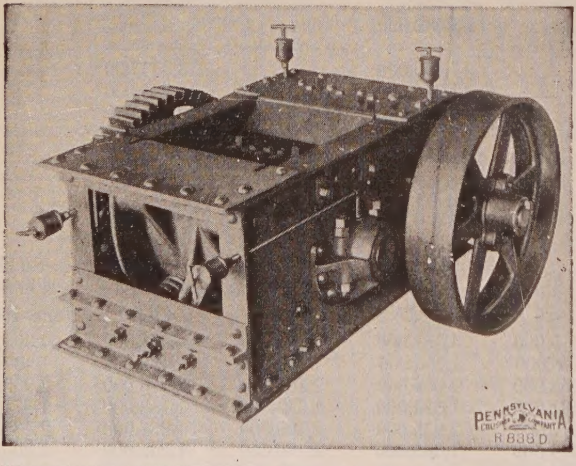
New Ingersoll-Rand Office

The Ingersoll-Rand Company has opened a branch office at 236 High Street, Newark, N. J. *Mr. F. K. Armstrong*, formerly connected with the company's New York sales branch, has been appointed manager.

Prest-O-Lite Branch

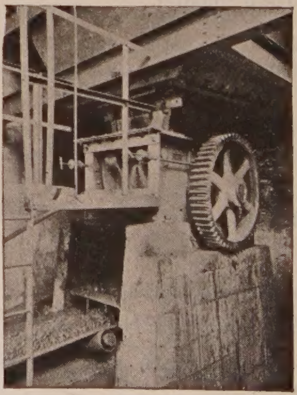
The Prest-O-Lite Co., New York City, announces the sale of the Storage Battery Branch of its business to a new company, *Prest-O-Lite Storage Battery Corporation*, New York City. That portion of the Indianapolis plant of the Prest-O-Lite Co., Inc., used for the manufacture of storage batteries has been leased to the new company.

"PENNSYLVANIA"
STEELBUILT CRUSHERS



"Pennsylvania" **ARMORFRAME** Single Roll Crusher showing I-beam frame construction, cut steel patented segmental roll, spring controlled breakerplate, cut steel gears and steel shearpin safety device.

An uninterrupted supply of coal properly prepared for pulverizing or stokers, is insured by the use of "Pennsylvania" Steelbuilt Coal Preparation Machinery with its unbreakable steel construction, accessible design and provisions for ample, safe lubrication. A rapidly increasing number of leading cement and lime plants have installed "Pennsylvania" ARMORFRAMES to insure proper preparing of coal. Capacities 20 to 400 tons hourly.



"Pennsylvania" **ARMORFRAME** Single Roll Coal Crusher, size 24 in. x 24 in., preparing R. O. M. Bituminous coal for pulverizing in Eastern Cement Plant.

PUT YOUR COAL PREPARATION PROBLEMS UP TO US

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